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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/790,120

03/02/2004

Daryl E. Anderson

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HEWLETT PACKARD COMPANY  
P O BOX 272400, 3404 E. HARMONY ROAD  
INTELLECTUAL PROPERTY ADMINISTRATION  
FORT COLLINS, CO 80527-2400

EXAMINER

BOUSIKARIS, LEONIDAS

ART UNIT

PAPER NUMBER

2872

DATE MAILED: 03/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/790,120	<b>Applicant(s)</b> ANDERSON ET AL.	
	<b>Examiner</b> Leo Boutsikaris	<b>Art Unit</b> 2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 02 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 14 and 21-24 is/are rejected.
- 7) ☒ Claim(s) 1-13 and 15-20 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>3/2/04</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Specification*

The disclosure is objected to because of the following informalities: It is suggested that the word “Fabre” is replaced with “Fabry” everywhere in the specification, including in the title and Abstract, to reflect the correct use of the above art term.

Appropriate correction is required.

### *Claim Objections*

Claims 1-20, 22-24 are objected to because of the following informalities:

Claims 1, 14, 21 recite “Fabre-Perot”. It is suggested that the word “Fabre” is replaced with “Fabry” to reflect the correct use of the above art term.

Claims 1, 15 and 22 recite in lines 10, 5, and 6, respectively “a second relative displacement”. It is suggested that the phrase “between the top and bottom plates” is used after “a second relative displacement”, for better clarity and to avoid any confusion regarding the principle of operation of the Fabry-Perot etalon.

Claim 8, line 2, recites “the piezo-electric element”, which lacks antecedent basis. It is suggested that the above claim is made dependent from claim 4 instead.

Claim 9, line 2, recites “the bottom conductive plate”, which lacks antecedent basis. It is suggested that the above claim is made dependent from claim 8 instead.

Claim 13, line 4, recites “bottom conductive plates”, which lacks antecedent basis.

Art Unit: 2872

It is suggested that "a" is inserted before "distance" in line 4 of claim 14, for better clarity.

Claims 2-13, 16-20, 23-24 inherit the deficiencies of claims 1, 14, and 22 from which they depend.

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 21-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 21 recites "first and second electromechanical transducer means for individually changing a distance between the top and bottom plates of the FP interferometer." The word "individually" is confusing since it is inherent that two separate transducers will "individually" change a distance between the two plates when they are energized.

Claims 22-24 inherit the deficiency of claim 21 from which they depend.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Art Unit: 2872

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 14, 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Hilgeman (US 5,452,121).

Hilgeman discloses a FP interferometer comprising a first and a second electromechanical transducer 3 and 4, wherein when each transducer is energized the relative distance between the top and bottom plates 1 and 2 changes (lines 58-68, col. 2). It is noted that the language referring to a FP interferometer in a DLD MEMS device constitutes intended use and it has not been given patentable weight.

***Allowable Subject Matter***

Claims 15-20, 22-24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, and if the objections for said claims set forth above are overcome.

Claim 1 would be allowable if rewritten or amended to overcome the objections, set forth in this Office action.

Claims 2-13 would be allowable if rewritten to overcome the objections, set forth in this Office action, and to include all of the limitations of the base claim and any intervening claims.

Claims 1-13, 15-20, 22-24 are allowable over the prior art of record for at least the reason that even though the prior art discloses FP interferometers comprising a single actuator for changing the distance between the two plates or mechanical means associated with each of the two plates to move the two plates independently, the prior art fails to teach or reasonably

Art Unit: 2872

suggest, regarding claims 1-13, a device comprising a first electromechanical transducer which is associated with the top and bottom plates and a second electromechanical transducer which is associated with the bottom plate, wherein the second relative displacement is substantially independent of the first relative independent, regarding claim 15, a method of tuning a resonant cavity of an FP interferometer comprising inducing a first and a second relative displacement between the top and bottom plates, which are substantially independent from each other, regarding claims 16-18, a method of tuning a resonant cavity of an FP interferometer comprising locating the second electromechanical transducer below the bottom plate of the FP interferometer, regarding claims 19-20, a method of tuning a resonant cavity of an FP interferometer comprising controlling a top plate voltage for achieving a first stage adjustment and controlling a bottom conductive plate voltage for achieving a second stage adjustment, and regarding claims 22-24, an apparatus for fine tuning a resonant cavity of an FP interferometer, wherein a first and a second relative displacement between the top and bottom plates are substantially independent from each other, as set forth by the claimed combination.


In Hilgeman's etalon, piezoelectric actuators 3 and 4 are moved in concert to change the distance between the two plates. Lunt (US 2005/0078906, Fig. 6) discloses a FP interferometer 10, which is enclosed in a housing, such that each optical plate is separately moved by respective mechanical means (e.g., cap 36 and screws 480), see [0036]. Finally, Tucker (US 6,400,738, Fig. 3) and Flanders (US 2001/0028503, Fig. 1) disclose conventional FP interferometers, wherein the distance between a suspended top plate and a bottom plate is adjusted by the use of a single electromechanical transducer, e.g., electrostatic actuator associated either with both plates or with the bottom plate.

Art Unit: 2872

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Leo Boutsikaris whose telephone number is 571-272-2308.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Leo Boutsikaris, Ph.D., J.D.  
Primary Patent Examiner, AU 2872  
March 13, 2006

  
**LEONIDAS BOUTSIKARIS**  
**PRIMARY EXAMINER**